M-SERIES MOTOR SIZING AND TORQUE CALCULATIONS (Table 2)

MODEL & SIZE	GEAR RATIO	Turns per inch TPI	Rated cap (lbs) P	STATIC TORQUE Ts	UNIT INPUT TORQUE AT RATED CAPACITY T = RUNNING TORQUE (lb-in) at VARIOUS RPM (Theoretical)								NO LOAD TORQUE To
					50 RPM	115 RPM	172 RPM	345 RPM	600 RPM	870 RPM	1140 RPM	1725 RPM	
M 1	5:1	25	2,000	48	35	33	32	29	27	26	25	24	4
	20:1	100		22	14	13	13	12	11	10	9	9	
M 2.5	6:1	24	5,000	130	94	87	83	76	71	68	65	62	5
	24:1	96		57	36	34	32	29	26	25	23	21	
M 5	6:1	16	10,000	377	269	248	236	216	202	192	185	174	12
	24:1	64		151	98	91	87	78	71	65	62	58	
M 10	8:1	16	20,000	827	567	519	491	446	414	392	377	353	18
	24:1	48		441	273	249	234	208	184	172	164	152	
M 15	8:1	16	30,000	1350	909	826	771	707	652	615	588	549	18
	24:1	48		719	441	399	376	331	293	273	259	239	
M 20	8:1	16	40,000	1912	1272	1147	1073	979	900	847	808	751	36
	24:1	48		999	609	551	518	453	402	375	355	327	
M 30	10 2/3:1	16	60,000	3056	1976	1770	1652	1499	1372	1287	1226		48
	32:1	48		1688	985	881	822	712	626	580	548		
M 50	10 2/3:1	16	100,000	6465	3880	3356	3166	2821	2544	2362	2235		96
	32:1	48		3705	1988	1730	1591	1329	1177	1082	1017		
M 75	10 2/3:1	16	150,000	10141	6082	5268	4965	4412	3965	3671	3464		156
	32:1	48		5231	2914	2555	2357	1995	1778	1640	1545		
M 100	12:1	16	200,000	15596	8750	7486	7006	6154	5487	5059	4761		204
	36:1	48		9027	4536	3868	3515	2913	2557	2340	2195		

For RPM's not shown use the next slowest RPM. For speeds less than 50 RPM contact factory.

10. Determine Uni-Lift Running Load Proportion Factor: (f)

$$f = \frac{P_3}{(P \times N)}$$

P = Rated Capacity of Uni-lift
P_3 = Max. system running load N= Number of Uni-lifts

11. Determine Unit Running Torque: (T_1) (lb-in)

$$T_1 = (T \times f) + T_o$$

T_0 = No load torque from chart
T = Running torque from chart

12. Find the System Running Torque: (T_2) (lb-in)

$$T_2 = \frac{(T_1 \times N)}{e_1}$$

e_1 = System Arrangement Efficiency, see page 77

13. Find System Power:

$$\text{System HP} = \frac{(T_2 \times RPM)}{(63025 \times e_2)}$$

e_2 = Reducer Efficiency, see page 77
RPM = Uni-Lift input shaft speed

14. Determine System Starting Torque: (T_{s2})

$$T_{s2} = \frac{((T_s \times f) + T_o) \times N}{e_2}$$

T_s = Static torque from chart

15. Determine Motor Starting Torque: (T_{sm}) (lb in)

$$T_{sm} = \frac{T_{s2}}{(R \times e_2)}$$

R = Gear Reducer Ratio

16. Determine Motor Running Torque: (T_{rm})

$$T_{rm} = \frac{T_2}{(R \times e_1)}$$

- Select a motor with a power rating greater than HP requirement in step 13, a starting torque greater than T_{sm} requirement in step 15, and a motor running torque greater than T_{rm} in step 16. See motor chart page 64 for horsepower and torque ratings.
- Select system torque transmission equipment (reducer, mitre gear boxes, couplings, etc.) with ratings greater than the torque to be transmitted, see step 12 and system arrangements, page 77.
- Size shafting for system starting torque to be transmitted, see step 16, and Table B page 76.